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ABSTRACT

Peer social behaviors and interaction were observed in day care centers and family day care homes in order to examine the influences of experience and environment. The naturally occurring behaviors of forty toddlers and their peers were time sampled in day care settings. Day care facilities were community based and varied in group size, age composition, and the number and type of play objects. Experience with preschoolers as siblings or playmates and aspects of the inanimate environment in different day care settings influenced peer behavior. Small, mixed age groups in family day care facilitated talking. Center toddlers with older siblings engaged in more prosocial behaviors. Peer play was more complex when using nonportable objects in day care centers and space relationships in family day care. (Author/RH)

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Influences on Toddler Peer Behavior in Two Types of Daycare

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This article is based on portions of a dissertation submitted to Boston University in partial fulfillment of the requirements for a Ph.D. degree. Shorter versions were presented at the International Conference for Infant Studies, Providence, Rhode Island, 1978 and at the Eastern Psychological Association Meetings, Washington, D.C., 1978.

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Running Head: Influences on Peer Behavior

Abstract

Peer social behaviors and interaction was observed in daycare centers and family daycare homes in order to examine the influences of experience and environment. The naturally occurring behaviors of forty toddlers and their peers were time sampled in daycare settings. Daycare facilities were community based and varied in group size, age composition, and the number and type of play objects. Type of daycare setting, family or center, interacted with experience with preschoolers as siblings or playmates and with aspects of the inanimate environment to influence peer behavior. Small, mixed age groups in family daycare facilitated talking. Center toddlers with older siblings engaged in more prosocial behaviors. Peer play was more complex when using nonportable objects in daycare centers and space relationships in family daycare.

Influences on
Toddler Peer Behavior in Two Types of Daycare

Investigations into the growth of peer interactional skills in toddlers point to two major sources of influence: experience with other children and the inanimate context of the interaction.

A recent review of the growing literature on early peer interaction (Mueller and Vandell, 1978) concluded that peer familiarity is an important situational constraint on peer behavior. Prior experience with peers in general while not necessary for eliciting behavior between peers (c.f. Eckerman, Whatley & Kutz, 1975; Eckerman & Whatley, 1977; Ross & Goldman, 1976) appears to be advantageous for sustaining peer-toddler encounters. Length of experience with peers was found to be a more powerful predictor of complexity of interaction than age in Mueller's longitudinal study of same age peers (Mueller, 1978).

Moreover there are some indications

that experience with older playmates of siblings may enhance the development of peer interaction skills. Konner (1975) argues that multiage playgroups are not only the modal form of peer groupings from an historical perspective but are advantageous in that they function to transmit social behaviors and facilitate the integration of the younger child into the

wider social world. Toddlers find preschool age siblings to be attractive social partners and sources for imitation (Lamb, 1978). Dunn (1979) found that older siblings were better able than age-mates to give clear social signals and to interpret the toddler siblings more primitive social signals, thus shaping and maintaining the interaction between older and younger sibs. Therefore experience, especially with older children, appears to be a potential contributor to toddler peer competence.

Early peer interaction has also been shown to be influenced by inanimate objects. Mueller and his colleagues have argued that an infant's attention is directed towards a peer via his/her interest in the other's action on an object (Mueller and Lucas, 1975; Mueller, 1979). Laboratory investigations have found that some types of peer interaction become more frequent when toys are removed from the room or when only large nonportable play equipment is present (Eckerman & Whatley, 1977; DeStefano, 1975). The lack of objects may permit a focus on social signals in the absence of distraction from toys (Eckerman & Whatley, 1977). Large objects such as a rocking boat or climbing structure permit simultaneous use by two children without the imposition of sharing or taking turns (DeStefano, 1975).

To examine the influences of experience with older children and inanimate objects on toddler peer interaction we observed

the naturally occurring behaviors of toddlers and their peers in two types of daycare settings: family and center daycare. In family daycare, a woman cares for children in addition to her own in her own home. These community daycare settings varied on several relevant dimensions including age composition and play object availability. We expected social interaction to be more advanced in the heterogeneous age groups. Preschool age playmates were expected to behave much like older siblings, by shaping and maintaining peer interaction to produce more complex interaction and by serving as a model to be imitated by the toddlers. We also expected those toddlers who had prior experience with older siblings to engage in more complex and frequent peer interaction in daycare. Furthermore we expected that peer interaction would be more advanced when large nonportable or no objects were used in peer interaction.

Method

Subjects

Forty toddlers between the ages of 18 and 22 months of age participated in this study. All were full-term healthy infants who had been enrolled in daycare for at least 4 months prior to observation. Half of the toddlers were enrolled in family daycare, half in center daycare.

The average age of the toddlers was 19.5 months. They had

been in daycare an average of 8 months (range 4 to 17 months), having entered daycare around the time of their first birthday.

Half of the sample in each setting was female, half male. About two-thirds of each sample were white; the other one-third was black, hispanic, or asian.

Most of the parents had had some college education; the average level of completed schooling for mothers was college graduation and for fathers was some post-graduate work. All of the parents worked or went to school, their occupations ranging from clerical workers to lawyers. The majority of the children in both samples were from intact families. Two-thirds of each sample were only children. The others were second-born. Hotellings T^1 and individual Student t tests and Mann Whitney U tests showed no significant sample differences in the two settings.[1]

Settings

Lists of family daycare homes and daycare centers were obtained from the regulatory agencies of the two urban areas where data collection took place. In addition to these lists (which gave no information about the ages of children cared for), lists of daycare facilities were obtained from three parent-referral services and one agency which coordinates and provides training programs for family daycare homes. Daycare centers established for research or demonstration purposes were excluded from the

sample.

One hundred and twenty-two family daycare homes in 15 communities were contacted. Three workers and one parent refused to participate and 103 homes did not have children within the 18 to 22 month age criterion. Fifteen daycare centers were contacted. Four centers had no children meeting the age criterion and three refused, feeling that the presence of an observer would be disruptive. Sixteen family daycare homes and eight centers were sampled. The centers were from the same or similar social-economic status communities as the family daycare homes. Data collection in family daycare homes and daycare centers occurred over the same 10-month period. About two-thirds of the daycare workers in each daycare setting were white; the other one-third were black, hispanic or asian. In 55% of the family daycare homes and 65% of the daycare centers, the child and daycare worker were of the same race.

Procedure

Data collection for each subject took place in two visits. A visit was made to the setting to acquaint the participants with the time sampling procedure and to interview the adult caretaker. If the toddler was in contact with several caretakers, the caretaker directly responsible for him/her was interviewed. A second visit involved time-sampling social behaviors and rating environ-

mental variables.

During both the warm-up visit and the actual time-sampling visit the adults were asked to go about their regular activities. They were told that we were interested in the activities of toddlers in their natural environments and that we wanted this to be as normal a day as possible.

The time-sampled observations lasted for two hours of morning free-play time. Time-sampling units were 15 seconds on and 15 seconds off. Each observation period included 240 time-sampling units.[2]

At the conclusion of the time-sampling period, the age composition of the peer group, the age of the child most often observed in interaction with the target child, the size of the group, and the number of each type of object were recorded.

Measures

Competent social interaction with peers was measured in terms of frequencies of socially directed behaviors between toddlers and peers; and in terms of the developmental level of the structure of interactive peer play. Table 1 lists the time sampled variables and their definitions.

Insert Table 1 about here

The structure of interaction. The structural level of interactive play was recorded for each time-sampling unit in which two children engaged in play. Play was defined as the toddler's participation in the same or similar activity. The five levels of play represent a developmental sequence from non-interactive parallel play with no social interaction through contingent social interaction to reciprocal and complementary interaction. In level 1, parallel play, the two toddlers are sitting side by side, absorbed in their individual activity; not even engaging in mutual eye contact. In level 2 play, parallel with mutual regard, the toddlers are in proximity, engaged in the same or similar activity and in eye contact. In order to be coded as level 3, simple social play, both toddlers have to direct a codeable social behavior to the other. For example, if toddler A pointed to her picture, looked at the other and said "da" and toddler B smiled and laughed, this finger-painting interaction would be scored as level 3. Level 4 is reciprocal and complementary activity plus mutual awareness. Level 5 is both contingent socially directed behavior and complementary and reciprocal activity such as a run chase or hide and peek game. This peer play scale meets Guttman scale criteria for unidimensionality and cumulativeness (Howes, 1979).

Each child received a score which represented the average level of interactive peer play during the period of observation.

This mean level of interactive play was calculated by multiplying the number of units at a given level of play by the level, adding all levels and dividing by the total number of units when the toddler engaged in interactive peer play. Play at levels 2 through 5 were included in the calculation. Level 1 peer play is not interactive. The higher the score on mean level of interactive play, the higher the developmental level of peer interaction.[3]

Object in peer play. The type of object, if any, in use by the toddlers while engaged in peer play at any level of complexity was recorded. A nonportable object is too big for one toddler to carry and big enough to hold two toddlers. A portable object is small enough to carry.

Pretesting, Training, Reliability. The majority of the social behavior codes had been developed and used as part of another project (Rubenstein and Howes, 1976; Rubenstein and Howes, 1979). These variables were pretested in family daycare, daycare centers, and toddlers' own homes. Interobserver reliability was established on 14 subjects by 2 observers at the beginning and end of the study. Interobserver reliability was calculated by dividing the number of units where both observers agreed by the number of units where at least one observer recorded the behavior. The interobserver reliability for social behavior variables are presented in Table 1. Interobserver reliability for peer play cate-

gories ranged from .87 to .93 with a median of .89 and for the object used in peer play from .83 to .93 with a median of .92.

Results

Differences in child rearing environments:

The social experiences of the toddlers and environmental characteristics of the settings were compared for the two types of daycare. The age composition of the peer group in the two daycare settings was different. The peer group in family daycare was more heterogeneous in age than the peer group in center daycare. Specifically in family daycare the oldest child in the group was older ($\bar{x}$ age family 36.1m, center 27.2m) and a smaller percentage of the children in the group were within 6 months of the subject's age. The most common group in family daycare consisted of the toddler, a two year old, and one or two preschoolers, while the most common group in center daycare consisted entirely of toddlers.

The age of the child with whom the toddler most often interacted was recorded at the end of the observation period. The age of this primary playmate was not different in the two kinds of daycare and quite similar in age to the subjects ($\bar{x}$ age subjects 19.7m, $\bar{x}$ age playmate 22.7m). Therefore, peer groups in family daycare homes were more likely to include older children, but the toddlers in both settings tended to play with agemates.

The groups of children cared for in daycare centers were

larger than the groups cared for in family daycare. In family daycare the groups ranged in size from two to six children, with an average size of four children. The daycare center groups had a wider range, from four to thirty-four children, with an average of ten children. Despite these differences in size of group, the number of children cared for by each adult was not significantly different in the two settings ($\bar{x}$ family 3.7, $\bar{x}$ center 3.4).

Toddlers in daycare centers had more nonportable objects available for use in their play. Nonportable was defined as too big for a toddler to carry and big enough to hold two toddlers at once (e.g., a slide or platforms).

Peer behavior in the two daycare settings

Frequencies of socially directed behaviors. Table 2 presents frequencies of discrete socially directed behaviors between toddlers and peers in the two settings. A Hotellings T^2 indicated that there were no overall significant differences. Both toddler talk to peer and peer talk to toddler were significantly higher in family daycare.

Insert Table 2 about here

The structure of interaction

There were no significant differences between toddlers and

their peers in family daycare homes and toddlers and their peers in daycare centers in frequencies of play with peers at any level of interaction nor in mean level of interactive peer play. A Hotellings T^2 for all measures showed no significant overall difference ($T^2(5,35) = 8.33$, $p=.33$).

In both settings toddlers and their peers engaged in interactive peer play (levels 2 through 5) in 17% of the observation period. They engaged in noninteractive parallel play (level 1) another 6% of the time in family daycare homes, and 11% in daycare centers.

Differences in sex and race

There were no differences between girls and boys on any of the measures of peer socially-directed behaviors or interaction. There were also no differences in peer behaviors between white, black, asian and hispanic children, nor were there differences according to the race of the daycare worker.

Experience with preschoolers

Preschoolers in the peer group. To further examine the hypothesis that peer social interaction would be more advanced in peer groups which included preschool children as well as toddlers we examined the patterns of relationships between peer behaviors and age of the oldest child in the daycare peer groups. These relationships are presented in Table 3. There was a significant difference in

the pattern of correlations in the two settings (Bartlett test x^2=46.96 df=36 p≤.05).[4] In family daycare, where the age of the oldest child in the group ranged from 19 to 60 months, an older child was associated with higher frequencies of talking, smiling, imitating a behavior directed to him or her, and aggressing. In center daycare, where the age of the oldest child ranged from 22 to 36 months, there were no significant relationships between age of oldest child and peer behaviors.

Insert Table 3 about here

Preschoolers as older siblings. To examine the hypothesis that toddlers who had prior experience with older siblings would engage in more complex and frequent peer interaction in daycare we examined the patterns of relationships between peer behaviors and number of older siblings. About one-third of each sample had older siblings, ranging in age from 3 to 7 years old. These relationships are presented in Table 3. There was a significant difference in the pattern of correlations in the two settings (Bartlett test x^2 = 75.0 df = 36 p≤.05).[4] In daycare centers toddlers with older siblings were more likely to take toys from peers.

Objects

When peer play occurred, the type of object used, as well as

the level of play, was recorded. Four categories of object use were possible: portable objects; nonportable objects; a combination (e.g., rolling a truck down a sliding board); and no object. Frequencies of occurrence of these four categories are presented in Table 4. Toddlers in daycare centers used nonportable objects

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Insert Table 4 about here

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in their play more often than toddlers in family daycare.

To examine the hypotheses that peer interaction would be more advanced when large nonportable objects or no objects were used in peer play we calculated the mean level of interactive play in each of the four object conditions. Table 5 presents the mean level of interactive play in each condition.

Insert Table 5 about here

A two-factor mixed design with repeated measures on one factor analysis of variance found both a significant main effect for objects ($F(3,96)=5.17$, $p \leq .01$) and a significant setting by object interaction ($F(3.96)=6.31$, $p \leq .01$). Mean level of interactive play was significantly higher when toddlers in family daycare were not using objects or when toddlers in center daycare were using non-

portable objects than when a combination of objects was used in either setting (Newman Keuls, $p \leq .01$) or when no objects were used in the center daycare (Newman Keuls, $p \leq .01$).

Discussion

The most striking finding of this research is the similarity of both frequency of peer behaviors and complexity of interactive peer play in two fairly dissimilar child rearing environments. Despite differences in peer group age composition, peer group size, and available play objects only one measure of peer behavior was significantly different. These findings strengthen the position that peer experience and familiarilty are important influences in the development of peer interaction skills. The family and center daycare toddlers had comparable amounts of experience with agemates prior to our observation. Furthermore all of the toddlers were observed in familiar settings while interacting with familiar peers. Experience and familiarity appear to have been powerful factors in creating similar peer behaviors.

In selecting playmates the toddlers created another dimension of similarity between settings. Despite differences in peer group age composition the toddlers in the two settings chose as primary playmates children similar in age to themselves. Thus we actually observed agemate peer play even in the cross-age setting of family daycare.

A final point of similarity in the two samples was the close match on parental and child characteristics. This match may have controlled for any influences, some as yet undefined, associated with demographic, family, and organismic variables.

The greater frequency of toddler talking to peers in family daycare suggests that the older children in the peer group may be promoting speech as a means of social communication. Not only was there a difference between the two groups in talking but also as there was an increase in age of the oldest child in the family daycare settings toddlers talked more to peers and more often imitated the social behavior directed to them by the peer. This suggests that speech directed to the toddler by a preschooler elicited speech in response. Future studies of peer behavior need to address this issue directly via a coding scheme which would permit analysis of interaction sequences between toddlers and preschoolers.

The finding of an interactional effect between type of setting and experience with older siblings suggests a more complex influence of sibling experience than simply promoting more skillful peer interaction. [illegible] both settings previous experience with preschool age siblings did increase frequencies of some behaviors, suggesting that social skills learned at home with siblings are generalized to the daycare situation. However the particular

kinds of behaviors elicited differed depending on whether the toddler was in a daycare center or family daycare home. In centers more prosocial behavior was elicited while in family daycare more agonistic behaviors were elicited. It appears that the family daycare setting replicates a central aspect of a home setting which results in sibling rivalry behaviors, i.e., there is only one adult available to satisfy the needs of children who are in different developmental stages. Perhaps the toddlers in family daycare direct agonistic behavior to the preschooler in order to attract the adult's attention. Toddlers with older siblings would have had opportunities to learn this strategy. Toddlers in center daycare have several caregivers available and thus do not need to use the strategy of aggressing against the peer to attract attention. Freed from this constraint they apply their peer skills learned in interaction with older siblings by directing prosocial behavior to agemates.

The interaction between type of setting and objects used in peer play extends previous studies which have found that the type of objects available influences peer interaction (Eckerman & Whatley, 1977; DeStefano, 1975). The findings of this study suggest that the inanimate environment be defined not only in terms of toys but also in terms of the spatial arrangements in which the children may interact. In daycare centers where nonportable

play equipment was available, toddlers more often than family day-care toddlers used this equipment as the context for peer interaction and their highest mean level of interactive play occurred in this object context. Family daycare toddlers who had less access to nonportable equipment had similar frequencies of high level interactive play and the same mean level of interactive play as the daycare center toddlers. But their highest mean level of interactive play occurred when they were not using any objects. Observer notes on the coding sheets suggest that no objects is a misleading way to describe this particular inanimate context. The toddlers appeared to be using the spatial arrangements of the home to structure their play. Hallways, corners, and connecting rooms appear to have facilitated both spacing of toddlers and concurrent access in a similar fashion as did climbing structures or slides in daycare centers. The circle created by three intersecting rooms provided a path for a run-chase game that was very similar to the path created by, in, out, and around the playhouse.

The role of objects and of space relationships in the development of peer relationships may also differ according to the developmental level of the interaction between the two toddlers. While toys may initially aid in <u>establishing</u> peer contacts by bringing toddlers together via their mutual interest in a toy (Mueller and Lucas, 1975), the results of this study suggest that

the role of toys in maintaining interaction between well-acquainted toddlers is somewhat different. High level interactive play is maintained by an inanimate environment which organizes space so that the toddlers can focus on each other and respond to each other's actions on the physical environment without physically intruding. These spatial arrangements are found in large non-portable play equipment in daycare centers and in brief stairs and in curving hallways at home.

In conclusion this study lends support to the hypothesis that early peer interaction skills are developed via repeated experience with the same playmates in a consistent environment. The findings of interactions between type of setting and sibling experience and between type of setting and use of objects in peer play further support the notion that early peer interaction is embedded within a particular social and inanimate context which influences its frequency and structure.

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Footnotes

[1]Hotellings T^2 tests were used throughout this research to test for whole table differences between groups. This procedure assures that even when individual variables show no differences, there are no overall differences between groups (Harris, 1975, p. 13). Student t tests were used to compare interval measures. All significant interval measures with unequal variances were checked by Mann Whitney U tests. In all cases the direction and magnitude of the difference remained the same.

[2]The time sampling procedure is limiting. It provides only a conservative estimate of the frequency of social behaviors between peers rather than an actual frequency count. Socially directed behaviors which occurred more than once in a time sampling unit (e.g., 2 verbalizations) or in the time out period are not counted. The advantage of this procedure is that it permits live coding in the natural environment of a large number of simultaneously occurring variables.

[3]This score represents only the average level of peer play not the frequency of high level play.

[4]Setting differences in patterns of correlations were tested for significance by transforming the Pearson Product Moment intercorrelation matrices for each setting into matrices of Z scores.

The center matrix was subtracted from the family matrix and this matrix of differences was transformed to a Pearson Product Moment intercorrelation matrix. The 0's in the diagonal of the matrix were changed to 1's in order to apply the Bartlett test for randomness in a correlation matrix (Bartlett, 1950).

Table 1

Social Behavior Variables

Variable	Definition	Toddler to Peer Reliability[a]	Peer to Toddler Reliability[a]
Toddler to Peer			
Talk	talks or verbalizes	.94	.93
Offers	includes point or show	.86	.90
Smiles or Laughs	any positive effect	.95	.91
Exploratory or Positive Touch	includes pats, hugs, not aggression	.94	.88
Imitates	action or vocalization	.95	b
Imitates SDB	imitates peer's socially directed behavior to toddler	.87	b
Takes Toy	grabs object whether or not peer notices, not receive an offer	.93	.89
Aggress	hit, bite, pull hair, etc.	.91	.93

Table 1

(continued)

[a]number of time sampling units in which both observers agreed divided by number of time sampling units where either observer saw the behavior.

[b]Peer's behavior in this category was not recorded.

Table 2

Peer Behavior in Two Daycare Settings

Discrete Behavior	Family		Center			
	Mean	SD	Mean	SD	t	p
Toddler Talk	45.1	36.1	18.3	17.1	3.00	**
Peer Talk	35.6	21.3	17.1	13.7	3.28	**
Toddler Offer	7.2	6.3	5.7	5.9	.80	
Peer Offer	6.4	4.8	4.1	5.5	1.38	
Toddler Smile	12.7	10.6	15.1	17.0	.55	
Peer Smile	8.1	9.2	13.4	15.0	1.36	
Toddler Touch	4.2	4.6	5.0	5.6	.47	
Peer Touch	4.0	7.6	4.3	3.9	.16	
Toddler Take Toy	3.8	4.1	3.0	3.6	.66	
Peer Take Toy	3.1	3.1	2.4	3.2	.70	
Toddler Aggress	1.8	2.3	1.8	2.8	.00	
Peer Aggress	1.8	2.2	1.5	1.6	.41	
Toddler Imitate any Behavior	8.1	5.3	8.0	6.7	.03	
Toddler Imitate Peer's Behavior to Toddler	5.2	7.0	4.1	4.6	.56	

Hotellings T^2 (14,23)=6.18,p=.63

* $p<.05$

** $p<.01$

Table 3

Relationships between Experience with Preschoolers and Peer Behaviors[a]

	Age of oldest child in peer group		Number of older siblings	
	Family	Center	Family	Center
Behavior to Peer				
Talk	.50**	.06	-.25	.46*
Offer	.18	-.07	.37	.07
Smile	.44*	.09	-.05	.45*
Touch	.11	-.22	-.37	.64**
Take Toy	.06	-.02	.47*	.22
Aggress	.48*	-.21	.19	.30
Imitate Any Behavior	.14	.21	-.11	-.05
Imitate Peer's Behavior to Toddler	.48*	-.01	-.15	.16

[a]Pearson Product Moment Correlations, one tail

* $p<.05$

** $p<.01$

Table 4

Use of Play Objects in Peer Play in Two Types of Daycare

Type of Object	Family		Center			
	Mean	SD	Mean	SD	t	p
Portable	31.9	28.3	32.7	32.4	.08	
Nonportable	7.4	8.3	19.7	15.7	3.10	**
Combination of Portable and Nonportable	6.6	11.8	9.3	16.5	.58	
No Object	7.9	11.6	4.6	5.7	.80	

** $p < .01$

Table 5

Mean Level of Interactive Peer Play in Different Object Conditions[a]

Object	Mean Level of Interactive Peer Play	
	Family	Center
Portable	2.78	2.84
Nonportable	2.49	3.12
Combination	1.78	2.37
No Object	3.21	2.37

[a]N=17; toddlers in each setting had no access to nonportable objects.